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PROGRAMED EXCHANGES AND THE CONTROL OF AGGRESSION.
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SYSTEMS OF EXCHANGE - USING THE EXTINCTION, DISTRACTION, AND SUBSTITUTION EFFECTS SYSTEMS - WERE IMPLEMENTED TO DECREASE AGGRESSION AND PROMOTE COOPERATION AND SCHOLARLY BEHAVIOR, THREE SYSTEMS WERE TESTED USING EXCHANGE THEORY AS A GUIDE. THE SUBJECTS WERE FIVE 4- AND 5-YEAR-OLD BOYS DIAGNOSED AS HYPERAGGRESSIVE. EXPERIMENTAL CONDITIONS INCLUDED (1) THREATS AND PUNISHMENT BY THE TEACHER TO LOWER THE RATE OF AGGRESSION, (2) IGNORING ACTS OF PROVOCATION AND NOT RECIPROCATING WITH ATTENTION, AND (3) RECIPROCATING WITH ATTENTION, APPROVAL, AND TOKENS. THE MEASUREMENT APPARATUS CONSISTED OF TWO UNITS--(1) AN ESTERLINE ANGUS EVENT RECORDER AND (2) AN OPERATING PANEL WITH 20 BUTTONS. DIRECT OBSERVATIONS WERE ALSO EMPLOYED. GENERALLY, THE RESULTS SUGGESTED THAT THE RATE OF AGGRESSION WAS PROPORTIONAL TO THE REINFORCING VALUE OF THE TEACHER'S RECIPROCATION IN THE EXCHANGES SHE ESTABLISHED IN THE CLASSROOM. CONCLUSIONS WERE THAT THE TEACHER'S AUTHORITY IN THE CLASSROOM DEPENDED ENTIRELY ON WHAT SHE EXCHANGES AND HOW SHE LEARNS TO PROGRAM THOSE EXCHANGES. (RS)

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November, 1966

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PROGRAMMED EXCHANGES AND THE CONTROL OF AGGRESSION

The objectives in the present investigation are several: (a) To design a system of exchange using the extinction, distraction, and substitution effects (EDS) system in a school setting which would socialize hyperaggressive five-year old boys to become non-aggressive, cooperative, productive scholars without the use of punishment, that is, without making the avoidance of aversive stimuli such as ridicule, scoldings, or beatings, contingent upon non-aggression[1]; (b) To test experimentally this programmed system against the more traditional punishment oriented systems; (c) To refine aggression theory from which the system design was derived, thereby enlarging social exchange theory to include aversive exchanges.

INTRODUCTION

In a recent survey (21) primary school teachers were asked (a) to name types of student behavior in a classroom which they felt tended to disrupt the classroom most; and (b) to create in them feelings of anxiety. For the first question most teachers, some 72 per cent in fact, ranked aggressive behavior first, and another 19 per cent ranked it second; in answer to the second question, some 76 per cent ranked aggressive behavior first. This study also suggested that the reaction of the teachers to aggressive exchanges with children involved psychic and economic costs for the child. Thus, the rate of school "dropout" of children who subsequently attended a local comprehensive school were two and a half times as great for children diagnosed as "hyperaggressive" as for children whose past school record showed little evidence of aggressive behavior. Moreover, children with aggressive records tended to be over-represented among those who attended a local clinic for maladjusted juveniles. The study ends by suggesting that if more attention could be directed toward the problem of aggression in the classroom, and if children could be placed in specially designed nursery schools prior to their admission into the general school system the cost to the children and to their communities might be decreased.

Of course, the traditional treatment for aggression has been punishment or counter-aggression. Punishment is often effective in the short run in suppressing aggressive behavior in children. A punitive or authoritarian teacher often has very quiet, orderly students. However, as suggested, such quiet order may have a number of unanticipated consequences.

First, the utilization of aggressive means of controlling aggressive behavior evidently tends to increase the probability of aggressive behavior when the

punitive teacher is not looking (37, 45).[2] This prediction apparently obtains because those who are being socialized learn by imitation and themselves adopt the successful strategies used by their models in controlling the behavior of others (8,9).

Second, it makes constant and close supervision a requisite condition for it is only in the presence of the controlling agents that the behavior in question is likely to be suppressed. At the very least, this means a vast decrease in the present socializer-socializee ratio and/or a detailed control of behavior in all relevant institutional complexes. The police state represents a fair approximation of complete aversive control (3).

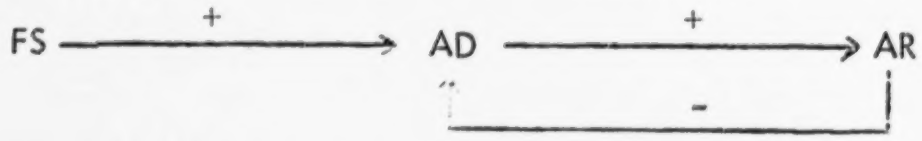
Third, punishment in the sense of the presentation of aversive stimuli (e.g., physical punishment), while it may suppress aggressive behavior, may also lead to the inhibition of a variety of other desirable behaviors, that is, a state of generalized inhibition may be induced (22, 7, 18, 51, 6). Furthermore, Bandura points out that one of the motivated side effects of controlling behavior through aversive techniques of socialization is the generation of a behavior pattern in which the actor tends to avoid the punishing agent. This in turn reduces the effectiveness of these particular agents for the further socialization of system participants. However, a student involved in frequent aversive exchanges not only comes to hate the teacher, but the school, the learning process, and, perhaps even himself as well--this according to Pavlov's laws of associative conditioning (28, 19).

But what alternatives are there to punishment? In recent years, an alternative system design has been based on Freud's theories of aggression. In one theoretical formulation, Freud conceived of aggression as a basic drive or "death instinct" and utilized an hydraulic model of personality in which the major diagnostic category was that of "energy buildup" to the point of bursting the defenses erected by ego and super-ego (36). In another formulation, Freud conceived of aggression as the "primordial (unlearned) reaction" to the frustrations inherent in social life. The major therapeutic strategy implied by both theories is that of "cathartic drainage," which is illustrated in the following extract from an influential textbook for teachers and parents:

> When pus accumulates and forms an abcess it must be opened and drained. If this is not done, it may destroy the individual. Just so with feelings. The hurts, fears, and angers must be released and drained. Otherwise, these too may destroy the individual. When enough fear, anger, and hate have been released, they diminish. They stop pushing from within. After enough of the "badness" has come out, the "goodness" appears (11).

As formally stated by Dollard et al. (20), the catharsis hypothesis holds that "the occurrence of any act of aggression is assumed to reduce (temporarily) the instigation to aggression"(see page 50). However, catharsis is just part

of their goal response theory of aggression: When progress toward a goal response has been instigated, then any interference with a posited tendency to complete that response sequence leads to frustration. The "dominant" reaction to frustration is the overt expression ofaggression. In this context then they suggest that whether or not the aggression expressed is directed to the source of frustration, the instigation to further aggression will be temporarily reduced--aggression is an end (a drive) in itself. Thus the goal response paradigm may be schematized as follows:



where FS = the frustration stimulus
AD = the aggressive drive
AR = the aggressive response

In the theoretical model presented above, the frustration stimulus (FS) is held to lead to an increase in the level of aggressive drive states (AD). This heightened (emotional) drive condition is relieved by an aggressive response (AR). The alleged reduction of aggressive drive following the expression of aggression is indicated by the minus sign affixed above the feedback loop leading from AR to AD.

In terms of this model the control of aggression may be obtained by (a) removing from the environment the conditioned or unconditioned frustration stimuli (FS) which are held to lead to an increase in strength of aggressive drive (AD); and (b) allowing the individual to freely express aggression. This latter strategy (based on the AR $\xrightarrow{-}$ AD feedback) assumes the operation of the cathartic, or, alternatively, the satiation effect. Allegedly, the individual keeps on responding aggressively until the tension associated with the aggressive drive AD is no longer relieved by overtly expressing aggression.[3]

These two strategies for the reduction of aggression have been embodied in several therapeutic designs. For example, consider the attempt by Redl and Wineman (46) to control aggression by holding "group therapy" sessions in a deliberately created "hygenic atmosphere," that is, a social structure from which the unconditioned and conditioned stimuli which are antecedent to and which are held to "cause" aggression are systematically removed and where constant opportunities for catharsis prevail. At Summerhill, A. S. Neill (43) also designed a permissive social structure in which frustration stimuli were allegedly taken out of the system. Unfortunately, however, these "experiments" were not designed to provide rigorous data to test the validity of the theoretical assumptions used in their design.

Nevertheless, in the laboratory the turn pin of the goal response theory--the catharsis hypothesis--has not fared well at all. A summary of some of the more important studies are given in Table 1. Note that the results are mixed (overt aggression decreased the aggressive drive in some experiments, and

TABLE 1

EMPIRICAL TESTS OF THE CATHARSIS HYPOTHESIS THAT THE EXPRESSION OF AGGRESSION WILL LEAD TO A DECREASE IN THE INSTIGATION TO FURTHER AGGRESSION[a]

Author	Date	Aggression expressed in:	Instigation to aggression measured by:	Subjects	Results[b]	Explained Variation
Kenny (40)	1953	Doll play	Projective test	Children	-	...
Feshback (23)	1955	a) Insult b) TAT cards	a) Questionnaire b) Sentence completion	Male-female college students	+	6.3%
Pepitone, Reichling (44)	1955	Insult	Questionnaire	Male adults	+	18.7
Thibaut, Coules(53)	1952	a) Angered b) Communication to frustrator	Description of frustrator	Male college students	+	4.2 4.7
Feshback (24)	1956	Doll play	Projective test	Children	-	...
Worchel (56)	1957	Frustrated	Digit symbol test	Adults (not col.)	+	5.1
Kahn (39)	1960	Insult	Questionnaire	Adults	-	..
Thibaut, Riecken (54)	1955	a) Personality rate scale b) Angered c) High/low status condition	a) Verbal responses b) Rating scale	Adults (male)	-	23.3
Horwitz (35)	1954	Angered	Questionnaire	Adults	-	...
Magaziner (41)	1961	Angered	Restoral of self-esteem	Adults	-	...
Hokanson, Shetler (33)	1961	a) Angered b) Electric shock	Systolic blood pressure levels	Male-female college students	-	3.6 2.8
Hokanson, Burgess (32)	1962	a) Angered b) Electric shock c) Verbal aggression	a)Systolic blood pressure b)Heart rate	Male-female college students	-	9.0 9.2

[a]Where explained variances are not presented, the data have been unavailable or statistical reporting inadequate for the transformation to be made.

[b]Negative results mean that the opposite of the cathartic effect occurred, that the expression of aggression produced an increase in the instigation to further aggression. Positive results mean that the cathartic effect obtained, that the expression of aggression did evidently decrease the instigation to further aggression.

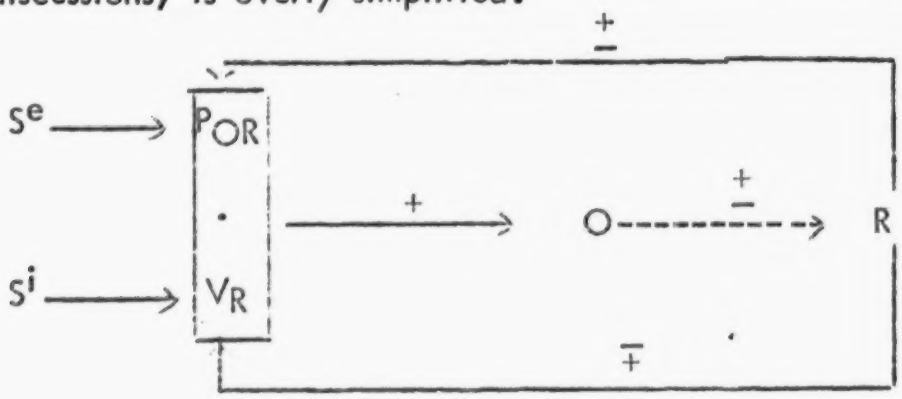
increased it in others) and weak (the variance explained in aggressive drive is low, on the average less than 10 per cent). Much has been written in the attempt to reconcile these results. However, let us simply observe that a theory which would generate such weak, inconsistent evidence is hardly worth the serious attention of scientists or therapists.[4]

The logical alternative to the goal response theory is an operant or an exchange theory of aggression. While the Yale group of theorists were all heavily committed to Hullian learning theory, they tried to make clear that their theory was not intended to embrace "instrumental" aggression. At the same time one notes a disparity between intention and actuality. In fact, Dollard et al. subscribed to a Janus-faced conception of aggression. In its goal response formulation, aggression was conceptualized in terms of the reduction in the strength of instigation to aggression contingent upon the expression of aggression. Yet in the beginnings of an operant formulation, aggression was conceptualized as "an act, the goal response of which is injury to the organism" (20). This failure to realize the dual implications of their theory has resulted in the neglect of an operant or exchange theory of aggression until fairly recently.

Within the past decade an operant or exchange theory of aggression has been outlined by Skinner (49), by Buss (17), used inadvertently by Galtung (26), and researched and elaborated to some extent by Bandura and Walters (10), by Day and Hamblin (19), and by Brown and Elliot (16). However, as a theory, it is still in a formulative stage awaiting a definitive statement.

Theorists who conceptualize aggressive behavior in exchange terms are ipso facto committed to certain commonly held views concerning the acquisition, maintenance, and extinction of operant or exchange behavior. They explain these processes in terms of the rewarding, punishing, or neutral consequences generated by the overt expression of aggression in past and present social exchanges.

As conceived by the second author, the main effects in the exchange theory, under which existing exchange formulations of aggression may be subsumed, are schematically presented in the following model which, although useful for introductory discussions, is overly simplified.



where S^e is an exchange stimulus;
S^i is an instigating stimulus;
P_{OR} is the estimated probability that O will result in R under the S^e condition;
V_R is the estimated value of R;
O is the operant or that which Person uses in the attempt to initiate an exchange for R;
R is Other's reciprocation;
$\longrightarrow$ are automatic or respondent relationships;
$\dashrightarrow$ indicates that O may (+) or may not (-) produce the exchange with Other for R;
$\pm$ and $\mp$ on the feedback loops show the reinforcing (or extinction) and the satiation (or intensification) effects for valued reciprocation (or non-reciprocation).

Thus, exchange theory suggests that operant or exchange behavior is a function of three kinds of stimuli: immediately, an exchange stimulus S^e and an instigating stimulus (S^i) (25), and in the long run, the reciprocation by the Others in the individual's environment.[5]

Traditional interference-frustration-aggression theory has focused simply upon S^i (interference), a concomitant of V_R (frustration) and O (aggression). The exchange theory suggested here assumes that S^e are equally important as instigating stimuli (S^i) in predicting the frequency, amplitude, or duration of aggressive behavior. These exchange stimuli have been relatively ignored in previous theories of aggression, but they explain why aggression will occur when a person is interfered with by some but not other individuals or in some but not other situations. Finally, R (the reciprocation by Other) refers to the consequences of behavior such as aggression. While the consequences of any one exchange may not have noticeable results, certainly in a programmed exchange, where the conditions are such that the exchange is repeated again and again and again, the consequences are cumulative in a way that can produce major effects by conditioning new stimulus-respondent relationships.

Punishment, of course, is one form of reciprocation, one of many possible consequences of aggression. We have noted in the opening how punishment does appear to inhibit aggression but that particularly in programmed exchanges it also produces other effects, most of which are delayed, not immediate, but are nevertheless costly from the point of view of the individual and of the system. However, even this brief, oversimplified introduction to exchange theory should suggest a number of alternatives to punishment for controlling aggressive behavior in the long run via programmed exchanges. For an exchange to become programmed so it will be repeated through time, a number of conditions must evidently obtain. As Homans suggests, both Person and Other must make a psychic profit, that is, the value of the reciprocation received must be greater by a certain margin than

the cost of operation. However, in addition to psychic profit, the terms of the exchange must be relatively fixed so that reciprocation is automatic. These conditions for a programmed exchange system may seem rather special at first glance, but in fact they are the very fabric of our societal structure. In our jobs, our families, our communities, our nations, hundreds of varieties of exchanges occur day after day, year after year in a relatively stable, repetitive way. Even many "so-called" aversive exchanges appear to have a programmed quality, at least those which endure as do certain marriages (Who's Afraid of Virginia Wolf?) and certain wars, hot and cold. The big task for the sociologist in particular is understanding these programmed exchanges, how the equilibria are produced and changed, and how over time they condition the participants to respond differentially. These ways can be conceived in terms of the operation of a number of the more sophisticated effects: reinforcement, extinction, distraction, and substitution (EDS). Let us consider each in some detail since they provide the theoretical base for the EDS system of therapy suggested and tested here.

The Reinforcement Effect. When a Person's operant response, which initiates the exchange with Other, results in positively valued reciprocation, reinforcement occurs--the EP associated with S^e is increased so the probability of the response O is increased when in the future the instigating stimuli S^i and the exchange stimuli S^e occur together. In a programmed exchange--where the reciprocation is regularly scheduled and where it is sufficiently valued to maintain a repetitive exchange--the frequency of exchange will gradually increase until an equilibrium is reached, presumably until the costs of effort to Person balance the rewards provided through Other's reciprocation. Consequently, a high frequency of aggression may be maintained in an exchange situation simply by always reciprocating in a way that reinforces it. Teachers and parents may seldom reinforce aggressive responses intentionally, but inadvertantly they often automatically reciprocate in a way that does in fact substantially reinforce an aggressive exchange. Brown and Elliot's (16) research does suggest that for most normal children the attention of a teacher, even negative attention, is reinforcing. In particular, attention-starved children will evidently endure considerable punishment to obtain their share of this precious commodity. Consequently, a teacher or a parent who attends a child when he aggresses may inadvertently reinforce his aggressive behavior and thus sustain a programmed exchange. More about this later.

The Extinction Effect. When Person's operant response which in the past has initiated a repetitive programmed exchange with Other suddenly fails to produce valued reciprocation which can reinforce or maintain the exchange, then the extinction effect will occur. As Homans' notes, Person will ordinarily experience frustration and anger during the early phases of extinction. However, as Person continues to try to initiate the exchange the frequency of the operant decreases. Because the effects of operant conditioning show up gradually, P_{OR}, the expectation that the operant will lead to the reciprocation in such an exchange situation ordinarily decreases slowly toward zero, until the operant is

no longer emitted. Since the decrease in the frequency is often gradual during extinction and the frustration-anger response immediate, the extinction effect is not often used to control behavior except in experiments. Without knowing the long term effects and without pairing it with other strategies, extinction is usually too aversive to Other to be popular as a form of reciprocation.

The Distraction Effect. At any given point of time a number of alternative exchanges are usually possible in most situations. Theoretically, the particular exchange which occurs is that which Person and Other expect will be most profitable at that moment. Therefore, any given exchange may be disrupted or aborted if Other distracts Person by presenting an S^i and an S^e associated with another more profitable exchange. Under such conditions, Person will usually cease the operant responses appropriate to the less profitable exchange and shift to those appropriate to the more profitable exchange. Thus a child who is crying for candy might be distracted to look for birds, and the crying will stop abruptly if she "enjoys" seeing birds more than she would "enjoy" candy. The distraction effect is particularly useful in moditying behavior when used in combination with other effects, such as the extinction effect.

The Substitution Effect. Finally, there are many operant responses available to Person which may be used in any given exchange with Other, and in fact Person will probably have developed a repertoire of such alternative responses during socialization. The particular operant which he uses first is one which in past exchanges has been reinforced most; that which he uses second is the one which in past exchanges has been reinforced next most, etc. Consequently, in programmed exchanges with Person, Other can differentially reinforce the particular operants he favors and thus subtly modify the nature of the exchange. Thus, if aggression is an operant used to influence Other in a disputed exchange situation, then Other can quietly reduce the frequency of aggressive responses by differentially reinforcing substitute operants, that is, other influence techniques. For example, parents usually eliminate "crying for things" in two-year olds by the differential reinforcement of "asking for things."

The EDS Strategy. In the classroom system design suggested and tested here, what we will call the EDS strategy (the extinction, distraction, substitution effects in combination) is used to eliminate the aggressive pattern and to install a cooperative-productive pattern of behavior in five four-year old boys. Thus, in the appropriate experimental condition the teachers were programmed not to reinforce aggression using attention or any other form of reciprocation and at the same time to distract the children into a more lucrative exchange and to reinforce systematically, substitute operant responses, i.e., cooperative and scholarly behavior. It was expected that if consistently maintained over time, such a programmed exchange system via the gradual processes of operant conditioning would effectively eliminate the aggressive pattern and replace it with a cooperative, scholarly pattern. Furthermore, we predicted that because of the laws of associative

conditioning, the side effects would be as positive as the reinforcers used in the exchange were valuable to the children. Consequently, by design, we used a relatively "rich" reward system, tokens that could buy sweets and juice during refreshment period, admission to movies, and toys during shopping periods--toys which the boys could take home.

METHOD

Subjects. Five subjects were used in this experiment, who, for the purpose of this report will be called John, Jack, Dan, Mike, and Barry.

John is a white, male Caucasian, from an upper middle class family, of superior intelligence, with no organic disorders, and at the commencement of the study was aged four years and six months. John, an only child, lived with his mother at the home of the mother's parents. When John was eight months old, his father left the home for a time, but returned following a reconciliation. However, the return was followed by separation, divorce, and remarriage. The mother, who works as a secretary, reports that the father never did like this child, who, incidentally, was born out of wedlock. He would frequently abuse the child and occasionally beat him. John's mother also reported that the child "never settles down," was constantly making demands, and screamed and broke things when he could not get his own way. John had previously been enrolled at a local nursery school, but the boy had so disrupted the class on frequent occasions that the mother had been asked to remove him from the school. It was at this point that the grandmother, who is a psychologist for one of the local school districts and who had heard of our school, referred the child to us. It should be noted that the teachers at John's nursery school had attempted to control the child's behavior by the adoption of such strategies as tying the child to his desk and having the rest of the class strike him one blow each as they paraded past him.

Jack, a male Caucasion, from a lower middle class family of above average intelligence, and with no organic disorders, was aged four years at the commencement of the study. Jack, whose parents were divorced, lived with his mother and his elder brother, aged eight. During the initial interview, the mother, who obviously doted on the child, reported that Jack was extremely destructive and cruel to animals. He was constantly disrupting the mother's daily round of home activities, and on one occasion had flown into a violent rage and struck his mother repeatedly, until she rescinded her demand. Such tantrums progressed until the mother's level of anxiety rose to the point where she could no longer restrain a visit to her local physician. One physical examination and four subsequent visits later, the doctor reported that he could find nothing wrong with the lad, but that if she wanted to, she could take her child down to the hyperkinetic clinic. It was at this clinic that she learned of our school.

Dan is male, Caucasian, from a lower class family, of average intelligence, with a slight speech impairment, and was aged four years and eight months at the commencement of the study. Dan lives with his mother, two elder sisters, aged six and eight years, respectively, and a tiny brother aged about nine months. The children are the product of a number of illicit liasons. The family lives in a notoriously slummy block of apartments, and his mother reports that he frequently fights with the neighborhood children. A few weeks before our school opened, Dan was expelled from his previous government-sponsored nursery school because of his violent behavior. The social worker attached to the family had heard about our nursery school from her supervisor, whom I had contacted earlier, and referred the child to us.

Mike is male, Caucasian, from a lower class family, of average intelligence, and with no organic disorder, and at the commencement of the study, was aged four years and four months. Mike lives with his divorced mother, two brothers aged about nine years and a year and a half. Mike's father left the home when the child was about two years old. Since then, the mother has been living with a succession of men. Her main source of income is an ADC check. During the past year the mother has been advised to undergo psychiatric treatment following an attempt to commit suicide. During the initial interview with us, Mike's mother reported that the child was violent and quite uncontrollable. This report was independently verified by the social worker attached to his family. Three weeks previous to our initial visit, Mike had stabbed his little brother in the face with a knife. Earlier in the year, Mike's elder brother injured his toe which then turned septic. The mother reported (and the social worker verified) that Mike would deliberately kick his brother's toe if the latter did not accede to his wishes. During the course of the study, the family had to be moved out of their flat in an apartment block because Mike chopped up several of the doors with a hatchet he had found. Mike had in fact been under treatment at the hyperkinetic clinic for about a year. However, his mother felt that no progress had been made, except that the drugs administered to the child did make him sleep at night. Mike was referred to us by a social worker.

Barry is male, Caucasian, from a lower middle class family, with no organic disorder, and was aged four years and three months at the commencement of the study. Barry lives with his mother, father, and two younger sisters. During the initial interview, Barry's mother reported that the child displayed severe tantrum behavior either when requested to do something that he did not want to do, e.g., going to bed in the afternoon, or, when prevented from doing something that he wanted to do, e.g., climbing through the window of his father's parked car. The child was reported to be extremely selfish, and would refuse to obey his mother. In particular,

he would never pick his toys up off the floor when he had finished playing with them. This task was usually performed by his mother and/or little sister. The child appeared to be very suspicious of strangers and fearful of almost all animals. Because of her growing inability to control the child's aggressive tantrum behavior, the mother took the child to her doctor, and as was the case with another subject, the doctor eventually told the mother that there was nothing he could do and that she should take the child to the local family and children's service agency. This agency referred the mother to our nursery school. Once in the laboratory it became apparent that Barry also had a rather severe touch phobia, which had not generalized to the members of his family.

The Setting and the Personnel. The experiment was conducted in the Social Exchange Laboratory, which was converted into a classroom. This conversion enabled us to retain the use of a one-way mirror and a room wired for sound. Three adults were involved full time in the study. Sally, a young female teacher who had received one year of formal instruction in educational theory together with Martha, a young female college student who administered tokens and recorded designated behaviors, were located inside the classroom. The experimenter, the first author, was located in the observation room adjacent to the laboratory. Neither Sally nor Martha were in any way familiar with the theory behind the procedures which they put into effect, nor, incidentally, were they informed in advance of the overall aims of the study. They were simply informed, prior to each condition, of what they were expected to do.

Equipment and Measurement. The measurement apparatus consisted of two units: a twenty-pen Esterline Angus event recorder and an operating panel with twenty buttons. Each button, embedded in a one-way switch, could be depressed independently of any of the others. Each child was assigned two adjacent buttons which could be pressed to record participation in a cooperative or an aggressive response sequence. In addition, another button was depressed whenever all five children were observed to be present at lessons.

In addition, a dictaphone was used to record the experimenter's verbal descriptions of on-going social interaction. Thus, verbal descriptions of the sequences of lesson changes, duration of lessons, duration of rest periods, type, intensity, and direction of aggressive and cooperative response sequences were all recorded.

A multipocketed cotton apron was worn by Sally and Martha. Each child was allocated two pockets, one to hold white tokens representing cooperative behavior and the other to hold red tokens representing aggressive behaviors. In addition, two large pockets were sewn on at both extremities of the row of smaller pockets. In one of these was stored a cache of red tokens and in the other pocket, a known quantity of white tokens.

Observations made by Martha in the classroom were recorded by means of the transfer of tokens from one pocket to another. Individual and group counts were made simultaneously, and served as an intra-observer cross check. Here is an example of how the recordings were actually made. Mike wants to play with the car that Jack is currently "driving." Jack, without answering, is about to move off when Mike pushes both boy and car over. Sally asks Dan to pick up car and boy--he does so. Martha meanwhile has taken two red tokens from the large pocket and puts one red token in the large pocket containing white tokens and puts the other red token into the "aggressive" pocket allocated to Mike. The number of red tokens in the large "white" pocket gives a group count, while the number of red tokens in Mike's pocket gives the individual count. Cooperative response sequences were similarly recorded.

Reliability of Observations. While the method of observation employed in this study was "direct," the observations themselves were made in terms of predetermined categories. These categories were originally developed by Gerwitz and subsequently refined by Walters et al. (55). The items in the Walters reclassification were then compared with those contained in a set of categories developed by the Iowa Child Study Group of researchers (1), and on the basis of this comparison, certain categories were collapsed to yield the categories which appear in Appendix 1.

Categories in hand and appropriate checkmark places left blank, the teacher, token woman, and the experimenter spent twelve hours in training. This training consisted of three visits of forty minutes each to three local nursery schools. The agreement between three independent sets of observations averaged 92 per cent. In addition, eighteen 40-minute reliability checks were also carried out during the course of the experiment; the within category agreement averaged 90 per cent.

Experimental Manipulations. An A-B-C-B-A design was used in this experiment. In such a design, the As, the Bs, and the Cs each represent the onset of different experimental conditions and the conditions are ordinarily maintained until a "practical" equilibrium is reached (that is, there is little or no variation for four consecutive days in the rate of the criterion variable, aggression in this experiment). Thus the experimental group is its own control since the results are obtained in such a way as to show the through-time effects of "in" and "out" manipulations of the independent variables.

Condition A was designed to approximate what would happen if our five boys were placed in a regular pre-school situation. Accordingly the teacher received the following instructions:

> You understand that these boys are hyperaggressive and thus may require special handling. However, during this initial period, you may use your own judgment as to how you should handle them. You have received a year's training in teaching children in this age group and,

> in addition, you must have some ideas of your own. Use whatever techniques you like. In addition, I want you to follow this one instruction: Give the children several tokens as soon as they enter the classroom. Tell them to put their tokens in the tins marked with their names. At "milk-time" have them give you one token for milk and one for biscuits, cakes, etc. At "film-time" they must present the third token, and the same during the shop period. However, allow the children to choose any toy they wish to take home.

In this, as in the other conditions, Martha was instructed to remain as unobtrusive as possible, to observe, and in some later conditions, to reinforce all relevant behaviors in a manner to be described later.

During the B condition, the EDS strategy was in operation. The attempt was to extinguish aggressive behavior by not reinforcing it in any way, while at the same time distracting the boys into a more profitable exchange system where tokens and therefore the various backup reinforcers were contingent upon cooperative and productive sequences. Thus, it was hoped to substitute a cooperative and scholarly style for an aggressive style.

To make this possible, the tokens were made contingent upon cooperative and/or scholarly behavior; that is, were no longer dispensed freely--they had to be earned. In scheduled activity, the boys received tokens, and the accompanying attention and praise for joining and intermittently for participating. Other times, if a boy took the initiative to help, to read a book, etc., he was given a token with a "thank you." Thus, they could take considerable initiative and the snacks, the movie, and the toys allowed them to spend as much as they could earn. In this way, an attractive exchange system was established which allowed the boys to obtain what they wanted from the teacher without using aggressive means.

However, when aggression did break out, the teacher and the token woman were to ignore the aggressor usually by turning their back to him, and at the same time engage the others in an interesting activity where they were obviously earning tokens for cooperative and/or scholarly behavior. Only if another child was about to be hurt seriously did the teacher intervene and then just restraining the aggressor while giving attention and words to the aggressee.

Thirty seconds or so after a boy stopped aggressing, the teacher was to include him in any remarks she made to the group, and she was again to start reinforcing him for cooperative and/or scholarly behavior.

Condition C was a mistake, albeit a fortunate one, the consequence of a nervous consultant and two nervous experimenters. When Condition B was

instituted, the level of aggression dropped precipitously (60 per cent) for two days, then appeared to increase or at best level out for the next two days--at a level much higher than we were willing to settle for. Instead of waiting for a steady state as strict experimental procedures dictate, at the urging of a consultant, we talked ourselves into substituting mild punishment (i.e., charging tokens for aggression, for non-attention)--into trying the inhibition rather than the extinction effect. To this end the teacher was instructed:

> Starting today, I want you to charge the children a specified number of tokens every time you observe them trying to get what they want by engaging in any of these behaviors which we have decided to call aggressive. Say, 'If you wish to continue doing what you are doing now, it will cost you ____ tokens. If you join us you may earn some tokens.' If the boy continued to aggress, the teacher was to ask for payment, but not make an issue of it. All fines had to be paid before any boy could purchase sweets, admission to the movie, or toys.

Since in other respects this condition is identical to B, it tests an IDS system (a combination of the inhibition, distraction, and substitution effects).

Three small transceiver sets were used to keep the experimenter in constant touch with Sally and with Martha during the B conditions. Instructions delivered by the experimenter were consistent with those required during the experimental period, to ensure the non-reinforcement of aggressive response sequences and the reinforcement of cooperative response sequences within a thirty-second interval every time such a response was observed. Toward the end of B2 instructions were limited to those required to deal with novel situations--both Sally and Martha had learned how to handle routine situations fairly well.

RESULTS

The basic statistical results are given with ample commentary in Figures 1 to 3 and Tables 2 to 7. However, we do wish to supplement these results with some descriptive examples of exchanges which characterize the equilibria produced in the various experimental conditions.

The following is not atypical of the severe aggressive sequences that occurred during the two A periods:

> Martha and Sally are talking to each other. Mike, John, and Dan are seated together on the hardboard playing with individual pieces of Playdoh. Barry, some distance from the others, is seated and also playing with Playdoh. Children, except Barry, are talking to each other about what they are making. Time is 9:10 a.m. Sally (teacher) turns toward

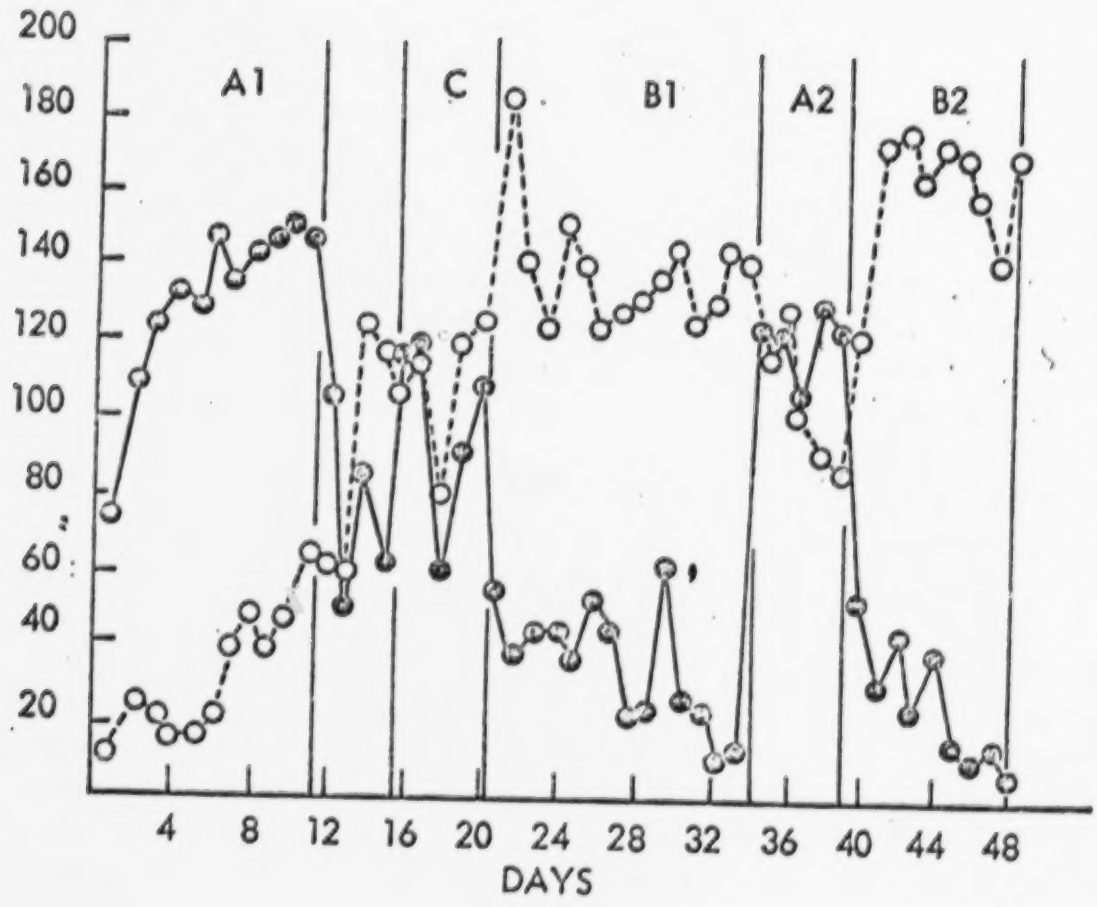


FIGURE 1. The frequency (totals) of aggressive and cooperative sequences for five hyperaggressive children aged between four and five years. In the A 1 condition the teacher tried to control aggression by threats and/or actual punishment, physical or verbal. On the other hand, when the children were cooperative the teacher praised or otherwise rewarded the children only infrequently. This pattern of teacher responsiveness produced an average of 159 aggressive and 43 cooperative sequences for the A 1 condition. During the C condition (days 16 to 20), the teacher tried to increase cooperative behavior by praising or otherwise rewarding every observed cooperative sequence while at the same time trying to control aggressive behavior by charging the children tokens if they wished to continue aggressing. This method of discipline produced an average of 104 aggressive and 117 cooperative sequences for the C condition. During the B 1 condition (days 35 to 39), the teacher continued to try and increase the frequency of cooperative behavior by rewarding every cooperative sequence but now, instead of charging the children tokens for being aggressive she simply ignored them while they were actually aggressing. This method of discipline increased the average number of cooperative sequences from 117 to 162 and decreased the average number of aggressive sequences from 104 to 27. During the A 2 condition (days 35 to 39) the teacher went back to the A 1 method of discipline and in so doing increased the average number of aggressive sequences from 27 to 138 and decreased the average number of cooperative sequences from 162 to 124. In the final B condition (day 40 onwards) the teacher went back to the B 1 method of discipline and in so doing decreased the average number of aggressive sequences from 138 to 16 and increased the average number of cooperative sequences from 124 to 181.

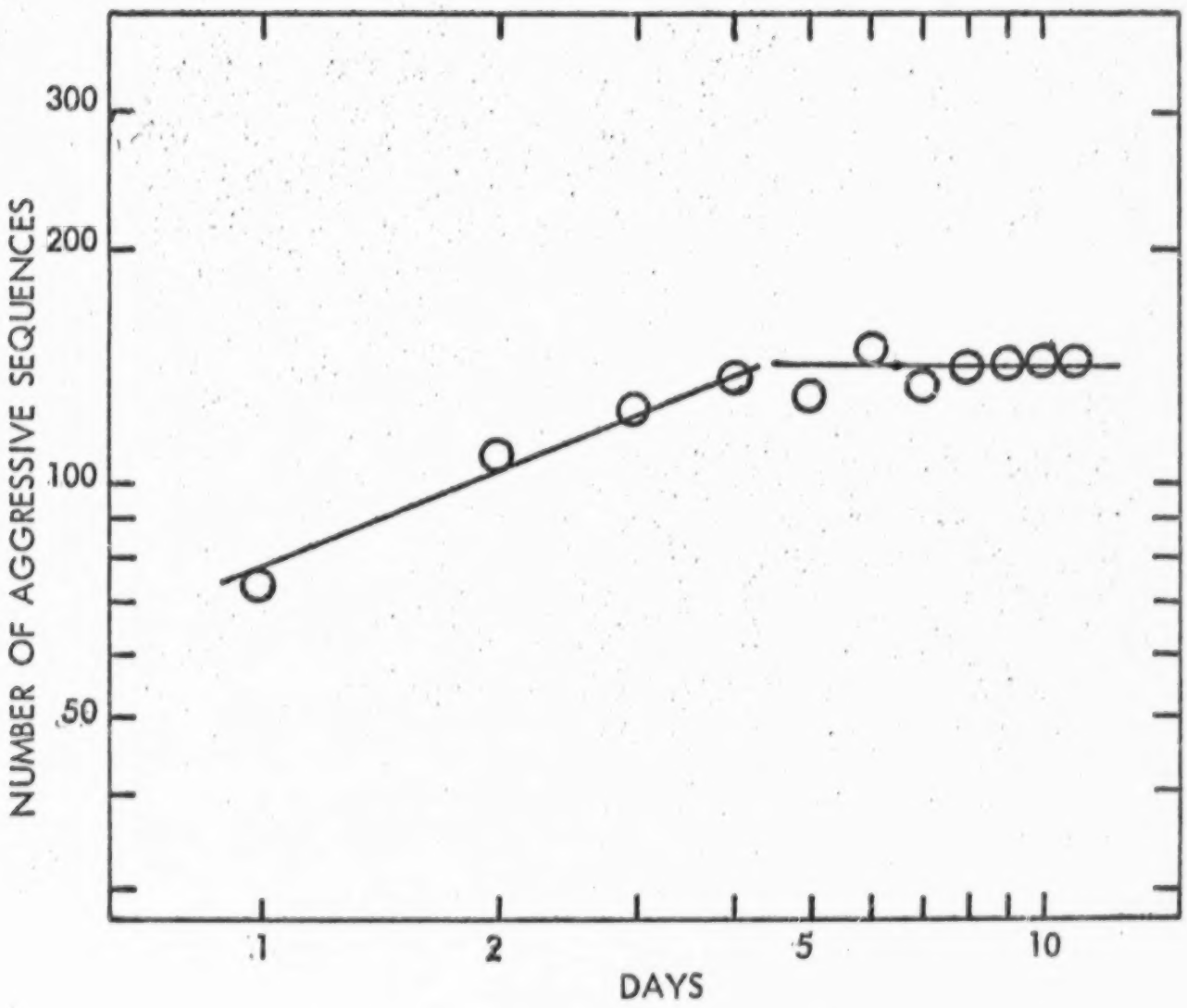


FIGURE 2. During A1 where aggression was ordinarily reinforced by attention and capitulation, the number of aggressive sequences per day increases as a linear function on logarithmic coordinates, to a point, that is. At that point an equilibria obtained, apparently where the cost of aggression equals the rewards of aggression. During start up periods for programmed exchanges such as this, the rate of exchange usually increases (as it does here) as a power function of cumulative time until an equilibrium point is reached. The startup equation for these data is $A = 78T^{.42}$, explained variance (r^2) is .96.

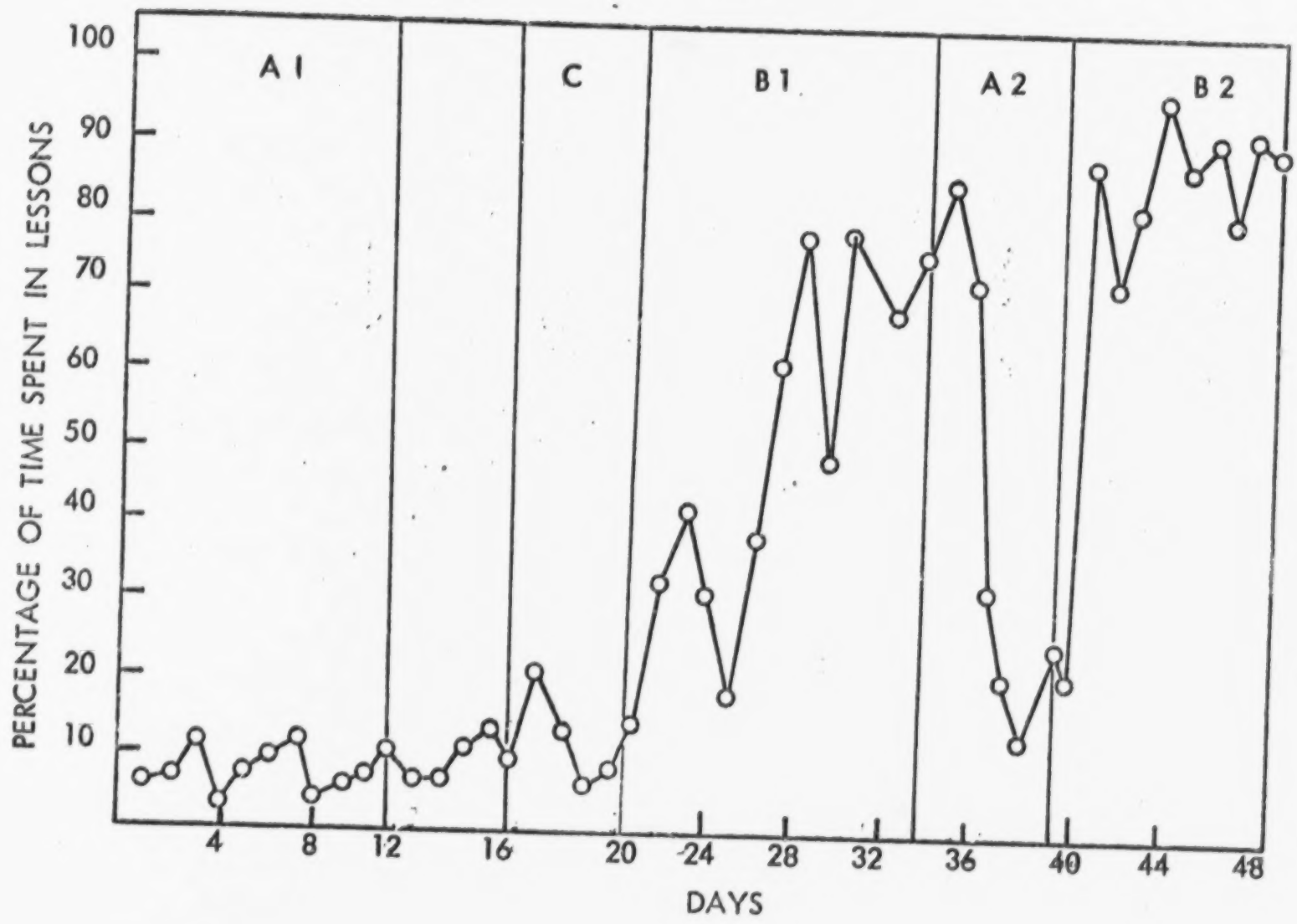


FIGURE 3. The percentage of time all five subjects spent in attendance at formal lesson periods during each school day in which 18 per cent of the time was devoted to formal teaching. During the first A period when the children were more frequently scolded for non-attendance than praised or otherwise rewarded for attendance, all five subjects attended lessons for about 8 per cent of available lesson time. During period C (days 16 to 20) the children were praised, attended to, or given tokens every time they attended lessons but they were also charged tokens for non-attendance. Under this method of discipline the children attended lessons for about 14 per cent of the available time. On day 21 and until day 34 (Condition B 1), the "charge system" was abandoned and instead children who did not attend lessons were ignored. Those who did attend lessons were rewarded for every attendance--just as in the C condition. Under this method of discipline attendance at lessons during the B 1 condition increased to an average of 74 per cent of available lesson time. When in the second A condition (days 35 to 39) the teacher went back to the A 1 method of discipline, attendance at lessons decreased from 74 per cent to an average of 23 per cent. Finally, during the B2 condition, when the teacher had now gone back to the method of discipline that had obtained in B 1, the average time spent at lessons increased from 23 per cent to about 93 per cent of available lesson time.

TABLE 2

AVERAGE RATE OF AGGRESSIVE AND COOPERATIVE RESPONSE SEQUENCES DURING THE LAST FOUR STEADY STATE DAYS OF EACH OF FIVE EXPERIMENTAL CONDITIONS (N = 5 SUBJECTS)

Experimental Condition	Aggression	Cooperation
A1	159	43
C	104	117
B1	27	162
A2	138	124
B2	16	181

TABLE 3

DIFFERENCES IN RATE OF AGGRESSIVE RESPONSE-SEQUENCES EXPLAINED BY BETWEEN-CONDITION CHANGES IN THE ARRANGEMENT OF REINFORCEMENT CONTINGENCIES

Experimental Conditions	Aggressive Response Sequences			
	Difference[a]	t-Value[c]	Significance Level	Explained Variance[b]
A2 - A1. . . .	-21	1.5	n.s.	11.5%
B2 - B1	-11	1.3	n.s.	7.2
B1 - A1. . . .	-132	13.7	$p < .001$	94.9
B1 - C	-77	4.8	$p < .001$	68.7
B2 - A2. . . .	-122	4.3	$p < .01$	64.1
A2 - B1. . . .	+111	8.6	$p < .001$	78.4

[a]Based on differences of last four steady state days in each condition.

[b]Estimate of Omega squared $= \frac{t^2 - 1}{t^2 + N1 + N2 - 1}$ in (31).

[c]Note the first five differences show a decrease in the rate of aggressive sequences through time (i.e., all of the differences are negative). However, only three of the five are statistically significant.

In addition, A2 - B1 difference is positive, and highly significant showing the crucial reverse trend when changing from the EDS to the punitive system of socialization.

TABLE 4

DIFFERENCES IN RATE OF COOPERATIVE RESPONSE-SEQUENCES EXPLAINED BY BETWEEN-CONDITION CHANGES IN THE ARRANGEMENT OF REINFORCEMENT CONTINGENCIES

Experimental Conditions	Cooperative Response Sequences			
	Difference[a]	t-Value	Significance Level	Explained Variance
A2 - A1.	81	8.8	$p < .001$	88.4%
B1 - 32.	19	4.0	$p < .001$	60.0
B1 - A1.	119	8.1	$p < .001$	86.6
B1 - C	45	2.8	$p < .001$	50.0
B2 - A2.	57	4.3	$p < .001$	63.6
A2 - B1.	-38	-5.9	$p < .001$	70.1

[a]Based on differences in means of last four steady state days in each condition.

[b]Note that in the first five comparisons the differences show a significant increase in the rate of cooperative response sequences through time. Thus, something of a Hawthorn effect occurred in this series of experiments; however, the A2 - B1 difference is negative and highly significant showing the crucial reverse trend when changing from the EDS to the punitive system.

Thus a large part of the differences were apparently due to the experimental manipulations.

TABLE 5

DEGREE OF VARIATION IN AGGRESSIVE SEQUENCES OF INDIVIDUAL SUBJECTS ACCOUNTED FOR BY CHANGING THE ARRANGEMENT OF REINFORCEMENT CONTINGENCIES (N=5)

Subject	Arrangement of Contingencies					Explained Variance*
	Agg. Seq.	Agg Seq.	Agg. Seq.	Agg. Seq.	Agg. Seq.	
	A1	C	B1	A2	B2	
John . .	56	38	8	48	5	94.1%
Jack . .	7	5	3	6	2	51.2
Dan . .	28	21	5	24	3	84.3
Mike . .	57	35	9	52	4	91.2
Barry . .	11	5	2	8	2	65.1
Totals.	159	104	27	138	16	

*Variation explained. These percentages are based on the transformation of t-scores (via Omega squared) which themselves were based on mean differences in the last four days in each experimental condition.

[a]Data presented in this table show the degree to which the rate of aggressive sequences emitted by each individual subject is high under the A (punitive) system, is moderately high under the C (IDS) system, and is low under the B (EDS) system. It is interesting to note that the EDS system appears to work more effectively with the more aggressive children. Compare the degree of variation explained for Jack and Barry. In this connection see also Table 7.

TABLE 6

DEGREE OF VARIATION IN COOPERATIVE SEQUENCES OF INDIVIDUAL SUBJECTS ACCOUNTED FOR BY CHANGING THE ARRANGEMENT OF REINFORCEMENT CONTINGENCIES (N = 5)

Subject	Arrangement of Contingencies					Explained Variance*
	Coop. Seq.	Coop. Seq.	Coop. Seq.	Coop. Seq.		
	A1	C	B1	A2	B2	
John . .	5	20	29	18	37	56.7%
Jack . .	12	25	30	24	34	46.6
Dan . .	8	23	38	31	38	53.8
Mike . .	7	22	29	25	33	51.2
Barry . .	11	27	36	26	39	54.5
Totals	43	117	162	124	181	

[a]Data presented in this table show a gradual overall increase in the rate of cooperative sequences emitted by each subject. Between-condition learning probably accounts for the relatively small individual differences in rates of responding associated with the A2 aversive / B2 EDS reversal in the arrangement of contingencies.

TABLE 7

PERCENTAGE OF AGGRESSIVE AND COOPERATIVE RESPONSE SEQUENCES ACCOUNTED FOR BY EACH SUBJECT IN EACH OF FIVE EXPERIMENTAL CONDITIONS

Subject	Experimental Condition									
	A 1		C		B1		A2		B2	
	Aggr. %	Coop. %	Agg. %	Coop. %	Agg. %	Coop. %	Agg. %	Coop. %	Agg. %	Coop. %
John	33.7	17.6	31.7	15.9	35.5	18.1	37.9	18.5	38.1	20.5
Jack	3.9	19.0	3.4	21.6	5.3	17.5	3.8	21.6	4.6	22.2
Dan	17.8	22.1	16.9	25.4	21.6	21.6	15.0	17.0	14.4	18.4
Mike	37.8	20.8	39.8	16.0	32.3	20.9	37.3	20.7	37.8	18.1
Barry	6.9	20.5	7.2	22.0	5.8	21.7	5.8	22.0	4.6	22.2
Totals . . .	99.0	100.0	99.0	100.9	100.9	99.9	99.8	99.8	99.9	99.8

Data depicted in this table show that John and Mike accounted for almost 75 per cent of the total aggressive sequences emitted in each experimental condition. Intra-group differences in the emission of cooperative sequences are far less marked.

children and says, "It's time for a lesson. Put your Playdoh away." Mike says, "Not me." John says, "Not me," Dan says "Not me." Sally moves toward Mike. Mike throws his Playdoh in Sally's face. Sally jerks back, then moves forward rapidly and snatches Playdoh from Mike. Puts Playdoh in her pocket. Mike screams for Playdoh, says he wants to play with it. Mike moves toward Sally and attempts to snatch the Playdoh from Sally's pocket. Sally pushes him away. Mike kicks Sally on the leg. Kicks her again, and demands the return of his Playdoh. Kicks Sally again. Picks up a small steel chair and throws it at Sally. Sally jumps out of the way. Mike picks up another chair and throws it more violently. Sally cannot move in time. Chair strikes her foot. Sally pushes Mike down on the floor. Mike starts up. Pulls over one chair. Now another, another. Stops a moment. Sally is picking up chairs, Mike looks at Sally. Moves toward Mike. Mike runs away. John wants his Playdoh. Sally says no. He joins Mike in pulling over chairs and attempts to grab Playdoh from Sally's pocket. Sally pushes him away roughly. John is screaming that he wants to play with his Playdoh. Moves toward gramophone. Pulls it off the table; lets it crash onto the floor. Mike has his coat on. Says he is going home. Sally asks Dan to bolt the door. Dan gets to the door at the same time as Mike. Mike hits Dan in the face. Dan's nose is bleeding. Sally walks over to Dan, turns to the others and says that she is taking Dan to the washroom and that while she is away, they may play with the Playdoh. Returns Playdoh from pocket to Mike and John. Time: 9:14 a.m.

Wild? Very. However, this sequence is rather characteristic of conditions A when the teacher was left to her own devices. These were barbarous, tough little boys who enjoyed doing battle. Sally did her best to be firm, to be a peacemaker, to interest the boys in school, to discipline them, but as fighters they were just much more clever than she, and they always won. Completely uninhibited, they just escalated whenever she tried to get them to stop. Whether Sally wanted to or not, they would always drag her into the fray, and instead of giving up when the giant threatened, they just went to it harder, harder until she finally capitulated. Sally was finally driven to their level, trading a kick for a kick and a spit in the face for a spit in the face. She did the best she could. However, her teacher training or for that matter her socialization in American culture did not prepare her to handle these hyperaggressive boys. Thus, we are suggesting that her response to the situation was probably not too different from that of the usual teacher except that she was unusually game--perhaps out of loyalty to us and to the experiment.

We were very concerned about the boys during the A conditions and daily we discussed whether or not to terminate. However, as we watched these boys as they were being bussed to and from school, it became obvious

that they were enjoying it. Most of the time all were eager to come in the mornings and none were particularly anxious to go home. Mike in particular showed an interesting pattern. He would run happily to the bus, would talk and play happily during transit, upon arrival would race to the schoolroom door, and then perform a transformation to a deep scowl ready for his day's battle with Sally! The boys evidently enjoyed these battles; they were evidently reinforced by the attention and by their victories. Not that the attention and the victories did not levy substantial emotional costs, it is just that the rewards for them were evidently so much greater.

Of course, Sally was unaware that her attentions, her counter aggressions, her capitulations were valued by the boys but the data show the unmistakable signs of the reinforcement effect. In fact her reciprocation was so valued and so regular, a reinforcement effect occurred which was typical for a programmed exchange. The rate of exchange increased as a power function of cumulative time up to a point where equilibrium is reached, evidently where the value of the reciprocation balances the cost. As might be noted in Figure 2, this happened precisely in Condition A1 and the fit is excellent. Beyond that, the rate of exchange was extremely high during equilibrium--159 aggressive sequences per morning.

During condition C where earning and paying tokens was instituted and where tokens were charged for transgressions, aggression decreased to an equilibrium level of 110 sequences, a substantial change from A1. Even so, the level of aggression was several times higher than that found in the usual nursery school. The teacher had stopped fighting back and for that reason she stopped losing the battles. The boys were just not allowed to purchase anything until their fines were paid--to our relief, all learned to pay and without a fight or whining. However, in warning and in levying fines, the teacher automatically attended all aggressive behavior. This attention was evidently a powerful reinforcer; for it balanced the considerable cost of the lost tokens and the lost commodities which the tokens could buy to produce a substantial equilibrium.

During Condition C it became obvious that the boys had grown fond of Sally. Particularly Mike, John, and Dan liked Sally. They were always trying to sit by her and this jockeying for position was the source of many fights during this and later conditions.

> Time for Reading. Sally is sitting on the floor with all of the boys except Mike. The boys are quite attentive, all listening raptly. Mike decides to join the reading circle, tries to edge in between Sally and John. In an instant, John has his left arm locked around Mike's neck from the back and is choking him. Mike loudly cries and coughs for air. Sally to John, "If you do that it will

cost you five tokens." John has tokens in the locking hand. Releases momentarily, throws the tokens at Sally. Before Mike or Sally could react, the arm is locked again. Mike again coughing and screaming. Sally breaks the lock. John draws back. Mike stops crying. Sally starts reading again.

During the B periods, in addition to the distraction of the token exchange and the reinforcement of the substitutive cooperative and scholastic responses, aggression was mostly ignored. In both B1 and B2, the frequency of aggression declined to 27 and 16 sequences, respectively--a level not too unlike that found for any group of five intelligent boys in the usual nursery school. However, during the transition periods a great deal of aggression did occur. The following episode is more severe than usual but Sally's response is quite typical.

All the children except Mike are seated around Sally at the end of the classroom. It is lesson time--she is reading to them. They are attentive. Mike is seated at this end of the room on Sally's revolving chair. He did not have enough tokens to buy anything from the Shop, and now he is screaming at Sally to bring back the Shop. Sally ignores him--continues to read. Martha ignores Mike--focuses her attention on the remaining children. Barry turns around and looks at Mike. So do John and the others. Sally continues reading. As soon as Dan turns towards her, Sally gives him a token. The others turn; Martha is up dispensing tokens. Mike is watching. Mike starts screaming again. Brushes his outstretched arm across the table top knocking over all of the token cans. Looks over at Martha. Now at Sally. Sally continues to read. Mike gets up and knocks over one of the small steel chairs. Knocks over another. Another. Sally still reading--children all get one token for being attentive. Mike picks up a chair and walks over to the group. Over transceiver I tell Sally not to look up. Seven ticks on the large clock. Children are engrossed in the story. Mike backs away. Throws the chair down, but toward this end of the room away from the group. Walks back to the chair at my end of the room. Revolving on the chair. Now gets up and moves slowly, slowly and obliquely, i.e., from one wall to the other wall, toward the group. Now, standing by the locker within touching distance of Sally. Sally looks up at him for the first time. Says, "Thank you, Mike, for joining the group." Gives him a token which he snatches. Sits down beside John. Gets up. Picks up can from floor. Puts tokens in can. Rejoins group.

The EDS strategy in operation during the early part of B1 is also illustrated by the following:

It is almost time to go home. The children have been told that when they present Sally with a blue token they may take home the toys purchased in earlier shop periods. Dan asks Sally for his "winding toy." Sally asks

Dan for a blue token. Dan, copying John, replies "Stupid!" Whining now and asking for his toy. Sally ignores him, collects blue tokens from the other children. Dan moves over to the wall and, looking over at Sally, then at Martha, tugs a painting from the wall. Bends down. Picks up painting, tears it up. Still whining, asks Martha for his toy. Martha silent. All the children have their toys. Sally reminds the children of the reasons why they had earned a blue chip. Dan now opening Sally's desk drawer and rummaging through contents. Looks over at Sally. Bus drivers have arrived. Dan moves to paper strewn on floor. Picks it up and puts it in trash can. Moves over quickly before Martha can give him a chip and returns the contents of Sally's drawer to its original place. Sally comes over, smiles, gives Dan a blue chip and says, "Thank you for helping to clean up." Dan follows Sally to the toy cupboard and in exchange for the blue chip gets his winding toy.

Once an equilibrium was reached in the B conditions, aggression still occurred at times, but by and large, peace reigned as in the following:

All the children are sitting around the table drinking their milk. John, as usual, has finished first. Takes his plastic mug and returns it to the table. Martha gives him a token. Goes to cupboard, takes out his mat, spreads it out by the blackboard and lies down. Martha gives him a token. Meanwhile, Mike, Barry, and Jack have spread their mats on the carpet. Dan is lying on the carpet itself since he hasn't a mat. Each of them get a token. Mike asks if he can sleep by the wall. Sally says yes. John asks if he can put out the light. Sally says to wait until Barry has his mat spread properly. Dan asks Mike if he can share with him. Mike says no. Dan then asks Jack if he can share with him. Jack says yes, but before he can move over, Mike says yes. Dan joins Mike. Both Jack and Mike get a token. Mike and Jack get up to put their tokens in their cans. Return to their mats. Sally asks John to put out the light. John does so. Martha gives him a token. All quiet now. Four minutes later--all quiet. Quiet still--three minutes later. Time: 10:23 a.m. Rest period ends.

On one occasion, six days before the study ended, a revealing episode occurred before Sally and Martha arrived:

The children are in the classroom, ushered there by the driver. Mike has some money, which he is showing others. Dan snatches a 10 cent piece from Mike's outstretched hand. Dan evidently wants to use the money in the candy machine upstairs. Mike moves toward Dan while asking for his money back. John asks Dan to give Mike's money back. Mike continues to ask Dan for his money. Now he warns Dan that he will not share money with him in the future. (On previous occasions Mike had stolen money from his mother--about $1.75--and had in fact distributed it among the boys).

Time: 9:04 a.m. Sally and Martha arrive. Mike tells Sally that Dan has taken his money. Sally asks Dan, who nods and gives the dime back to Mike.

In the earlier A conditions Mike and Dan had many altercations. Dan could easily wrestle Mike to the floor and make him cry in the process. However, Mike had learned to win these battles with a well placed fist to Dan's nose which then always bled profusely. Mike most certainly would have done this now had his response pattern not be thoroughly reconditioned. Mike and the other boys no longer responded aggressively to every little interference, every little injustice. By this time a number of functional alternatives to aggression had been substituted, so that these rather than aggression were the initial response pattern.

DISCUSSION

The foregoing results give a partial picture of the stimulus respondent relationships which were conditioned through time in three rather different programmed exchange systems.

When the threat-punishment strategy was in operation in condition A1 and A2, the teacher attended the boys whenever they aggressed, and capitulated in the end whenever they escalated. On the other hand, she gave them very little for cooperative-scholarly activity. Consequently, any interference on the teacher's part became an S^i and the teacher herself an S^e and the result was aggression, aggression, aggression. Since aggression was always reinforced, the teacher could hardly give any direction without presenting the stimuli which triggered off another episode. But aggression was not limited to the teacher; this was a wee Hobbesian society with all in a small war against all. When any of the weaker boys (S^e's) evidenced enjoyment of a toy or any other object (S^i's), they also triggered an aggressive exchange which was almost always reinforced by capitulation.

When the IDS strategy was instituted, cooperative, scholarly behavior was reinforced with approval and with tokens which could be traded for a variety of pleasantries, and, in effect, for the privilege of aggressing. The teacher still inadvertently reinforced aggression with attention in levying fines, however. Under these conditions the tokens become S^{ii}s and any request by the teacher, any opportunity for helping, any lesson period S^e's which together maintained a substantial rate of cooperative, scholarly behavior. Interference by the teacher and opportunities to bully were still S^{ii}s for aggression and the teacher and the weaker boys S^e's. Together these still triggered a high frequency of aggression, but escalation ceased.

When the EDS strategy was in effect, cooperative, productive behavior was reinforced by approval and by tokens which could be traded for a number of valuables, but aggression was not reinforced even by the teacher's attention. As a

consequence, her attention, her approval, her tokens became S^i's and her requests, her instructions S^e's, which together eventually produced a high rate of cooperative scholarly behavior. On the other hand, by not reinforcing aggression , her interferences were no longer S^i's and she herself no longer an S^e, to trigger aggressive sequences. As a result, aggression dropped to a very low level. The children still reinforced one another's aggression, but those aversive exchanges were evidently not as valued as those with the teacher, so they occurred rather infrequently.

The data nicely show that this conditioning took time, that there was always a transition period before the equilibrium obtained. Even so, when a system was introduced for the second time, the transition was very brief.

In discussing these findings let us point out that the between-condition differences in equilibria accounted for substantial portions of the variance, for example, between 64 and 95 per cent for group totals for aggressive sequences. This is in part because we used a powerful methodology--relatively accurate measurement, control by constancy, and we waited until the various exchange systems produced equilibria. The latter two features, at least, are typically missing in social science research. However, strong methodology without strong theory never produces strong results. The experimental evidence gives strong support for an exchange theory of aggression. The details of our particular formulation may be improved in time, but over all, the theory predicts and explains the essentials of what happened for almost three months with those sometimes barbarous, sometimes civilized little boys. Furthermore, that everything was relatively constant except for the programmed systems of exchange, that the resulting equilibria changed consistently and understandably as these were introduced, replaced, and reintroduced is supporting evidence for the determinate assumptions in the theory.

In making these forthright conclusions, we do not wish to convey the impression that prior theories of aggression are totally wrong. In fact, they are partially correct, given the operation of the appropriate programmed exchange systems. As intimated above, in certain programmed exchange systems, interference (an S^i) in a conflict situation with another (an S^e) will trigger aggression. Thus, for certain American college students, supporting Dollard et al. , evidence has been obtained for a lawful relation ship between the magnitude of interference in a conflict situation and the magnitude of aggression.[6]

Furthermore, we would guess that in certain exchange systems, Homans' respondent theory of aggression will be true. In such civilized systems, S^e's, when distributive justice is violated, when money rewards are less than proportional to investments (S^i), then equilibrating behavior, including aggression, is triggered. Why? Because a self-righteous aggressive response to injustice is reinforced and rather systematically conditioned in civilized systems.

Finally, in barbarous systems, the sight of valued objects (S^i's) in the hands of weaker parties (S^e's) will very likely trigger aggression, again because such stimulus response relationships are reinforced and therefore conditioned. In such systems, bullies are ordinarily successful. They are restrained not by law and justice, but by effective counter-aggression.

Thus, we would expect different respondent theories of aggression to be formulated by scientists observing different exchange conditions as somewhat accurate descriptions of the SR relationships conditioned in those systems. The main difficulty then, with prior theories is not so much their substantive content but their incompleteness, their over-generality, and the fact that their originators failed to understand that the SR relationships being described were conditioned rather than unconditioned. This latter is a serious error because unconditioned relationships are almost by definition biologically programmed or determined.[7] Thus, unconditioned respondent theories imply that nothing can be done to rid mankind of aggression except perhaps by tampering with biochemistry via injections or pills or by inducing genetic changes. At least the present results suggest an alternative: the reprogramming of the key social exchange systems so as to avoid the inadvertent reinforcing of the more destructive, debilitating forms of aggression.

While the present experiment has focused on aggression and to a lesser extent upon cooperative and scholarly behavior, the results are relevant to, and imply certain modifications of, current exchange theories of power and authority. According to Blau's recent definition, a person has power to the extent he can influence others (13). Authority is a special case of power, where Person influences, in part, because his directives are enforced rather spontaneously by other members of the group or organization. Both Blau and Homans (34) have suggested that power and/or authority is achieved or maintained by exchange, that the acceptance of suggestions or the compliance with directives is ordinarily traded only for value received--help, approval, money, wages, etc.--or for the avoidance of the various forms of aversive reciprocation. However, like earlier efforts on the subject, their discussions focused mainly upon the identification of what is reinforcing (what is ordinarily traded for power and authority) and upon, in Blau's case, the strategies for increasing or decreasing the value of such reinforcers. While these emphases were and are well taken, the crucial problems of scheduling the exchange were ignored.

The present results suggest that the scheduling of exchange contingencies is crucial. In all conditions--A, B, and C--the children received the same basic reinforcers (quantitatively and qualitatively), teacher attention, tokens, sweets, movies, and toys. However, the teacher had almost no power in condition A, limited power in condition C, but almost complete power (and possibly some authority in condition B).[8] This is, of course, because the reinforcers were dispensed differently in each of the three conditions, because the contingencies varied. The general rule is that one will receive in an exchange in exaggerated form whatever

one reinforces with one's reciprocation and precisely that. In condition A, attendance and aggression were reinforced; in condition B, cooperative and scholastic behavior; and in condition C, cooperative, scholastic, and aggressive behavior. Only in condition B was the teacher having the influence or power that she wanted; in the other conditions she inadvertantly reinforced the disruptive, rebellious, aggressive behavior which she manifestly did not want and which, therefore, undermined her power. Her and our problem was to identify the reinforcers operative in the situation and to schedule the contingencies in such a way that these reinforcers would be used to reciprocate in programmed rather than inadvertant exchanges. Only when both of these problems were solved did the teacher achieve any real power.

On the other hand, the boys were working the system in all three conditions to get precisely what they wanted. In condition B as well as in conditions A and C, they eventually discovered and worked the contingencies to maximize their outcomes. Ultimately, they never had any power problems; in experimental conditions, they always found ways to influence the teacher to get what they wanted. It is just that the power exchange was almost completely unilateral in condition A, less unilateral in condition C, and bilateral in condition B. In B, the teacher finally was able to execute an exchange that resulted not in just what the boys wanted but in what both she and the boys wanted, an exchange finally that was largely void of costly friction.

The key, then, to equilibrated bilateral power or authority systems may not be more reinforcers but simply an intelligent scheduling of the exchange of those already available. It is fairly well established, for example, that immediate reciprocation is more reinforcing than delayed reciprocation. In fact, with children such as those used in the present experiment, the effective limit may range between 15 and 30 seconds. Beyond that, even highly valued reciprocation may have very little effect. Also, particularly while exchange systems are being shaped, a large increment of power is obtained by reciprocating to every, or to almost every, desired response. Consequently, it is helpful to fractionate massive reinforcers such as sweets, movies, toys, etc. For this reason barter systems are usually inferior to money systems. Money, such as the tokens used in this experiment, facilitates immediate reciprocation as well as fractionation. In addition, it always gives the receiver a certain flexibility, a certain freedom in choosing the backup reinforcers which may be exchanged for money.

Some seem to prefer an exchange system where they rather than others initiate the exchange. This is because it may be easier to initiate than to reciprocate; reciprocating effectively is a rare skill which requires attention and judgment. It took instructions and several days of coaching over the transceivers before Sally and Martha became really proficient. Thus, is it realistic for children and the less skilled generally to take the more difficult role of the reciprocator? Our evidence suggests that such an expectation is unrealistic. During the A conditions, the tokens

and other reinforcers were given as free gifts. This might have produced the appropriate reciprocation from subjects who had internalized fully the norm of reciprocity and who wanted to continue the exchange, but not those five boys. They were good enough at initiating exchanges once they gained a feel for the way reciprocation was scheduled, but their skills at scheduling positive reciprocation were nil. This may be the case generally. Frictionless, bilateral exchange systems may always require a skilled reciprocator, and skilled reciprocation may be the source ultimately of genuine authority.

In their reciprocation in A conditions, Sally and Martha went awry in several respects. First they were unaware of what was valued by the boys and thus they inadvertantly reinforced unwanted behavior. Secondly, they failed to reciprocate positively for the kind of behavior they wanted. This meant that cooperative and scholarly behavior ordinarily went unrewarded as did the less disruptive ways of initiating exchanges. So the boys responded accordingly. These seem to be rather common problems which people in our culture have with reciprocation.

Thus, while the present experiment has the virtue of suggesting a new strategy for establishing authority or leadership in the classroom and perhaps in other social organizations, putting the suggestion to work is more than a simple task. We doubt very much that most teachers would effectively use the EDS strategy without coaching. The average individual just has too many inappropriate responses that are firmly conditioned to be able to make the switch on his own. However, a little help--immediate positive reinforcement for appropriate reciprocation and immediate suggestions as to the handling of small crises--by a knowlegeable coach over a transceiver should make the transition possible, even rewarding.

While many have expressed skepticism about the applicability of laboratory findings to other systems, the prospect is not all that forbidding. The application of present findings to the structuring of classes in special school districts seems direct and obvious. These deal with children with problem behavior (as did our class) or with children with behavioral deficits. Also, the teacher-student ratio ordinarily allows the attention required by our or a modified EDS strategy.

The more serious problems of generalization are encountered in applying the EDS strategy in larger systems. In this respect, however, we must be somewhat non-directive, in part, because of the limitations of space. In general terms, the EDS strategy is well outlined herein and one application of the strategy is described in detail. At least it is a new strategy, a genuine alternative to the threat-punishment and/or the IDS strategy now employed in most systems. Furthermore, the theory of aggression upon which the strategy is based appears to be well supported by experimental data with boys. While boys are not men, they have the biological potentialities of men, and therefore nicely show how men might be conditioned. Certainly on this point the evidence of the present experiment is more relevant than evidence from animal studies which many authors, even

prominent ones like Ardrey (2), use in connection with their arguments for the inevitability of war. Why should war be inevitable? Perhaps, if nations could be coached to learn to reciprocate well. . . .

CONCLUSIONS AND IMPLICATIONS

1. The results in this experiment suggest that aggression is an operant. and as such tends to equilibrate in a programmed exchange at a rate proportional to the reinforcing value of the reciprocation. A simple, direct corollary follows: To change the rate of aggression in an ongoing system, it is necessary to change the relative reinforcing values of the reciprocation for aggression.

2. The five hyperaggressive boys used as subjects in this experiment evidently valued teacher attention very highly. When the teacher inadvertantly attended aggression while she was trying to suppress it via threat or punishment, the frequency of aggression was very high, 159 and 138 sequences per day when the punishment was never effective, when the teacher always capitulated in the end. Where it was effective, the attention the teacher inadvertantly gave in threatening and levying fines still maintained a high level of aggression, 107 sequences per day. Only when the teacher turned her back on all aggression and thus gave it no attention at all did aggression equilibrate at a near normal level, 27 and 16 sequences per day.

3. In addition to not reinforcing aggression, the teacher learned to distract the boys into alternative exchanges which were more profitable. Over time, the boys learned that they could exchange cooperative, scholastic behavior for teacher attention, approval, and in some conditions, for tokens and the things which tokens could buy: sweets, movies, and toys. In general, the frequency of cooperative, scholastic sequences increased throughout the experiment. However, the level was much higher when tokens were used in B1 and B2 than when they were not in A1 and A2. This was particularly true of the per centage of time spent in scholarly activity during the scheduled academic periods. While cooperative scholastic exchanges were valuable in and of themselves, they also functioned in part to counter-condition aggression, and thus lower its equilibrium level.

4. Thus, aggressive, cooperative, and scholarly behavior was managed rather easily by instituting the appropriate programmed exchange. The EDS strategy programmed in the exchange system in the B conditions was quite suitable for problem youngsters in this class. With competent coaching, the teacher learned to use the EDS strategy effectively in a two-week period.

5. The experience here suggests that teachers, students, classrooms need not bear the multitudinous costs of aggression and counteraggression. If there is a high level of aggression (or, by implication, any other undesirable

behavior) quite likely the teacher is inadvertantly reinforcing it in a substantial way. If desirable behavior is missing, quite likely the teacher is not reinforcing it in a substantial way. Thus, the present results emphasize the importance of the teacher, and the teacher's training. To have authority and thus to obtain the effects which she desires in the classroom, the teacher must be aware of the consequences of her reciprocation and learn to program classroom exchanges.

SUMMARY

Using exchange theory as a guide, three exchange systems each programmed to decrease aggression and promote cooperation and scholarly behavior were tested in an experiment using an ACBAB design. The subjects were five 4 and 5-year old boys who had been diagnosed as hyperaggressive. When the teacher used threats and punishment in attempting to lower the rate of aggression, she inadvertantly reciprocated with quantities of attention which was reinforcing and thus produced the opposite effect. Aggression increased and then equilibrated at a high rate. When the teacher turned her back to provocations, thus not reciprocating with attention, aggression equilibrated at a near normal level. Cooperative, scholastic behavior likewise changed with differential reinforcement. When the teacher reciprocated with attention and approval, cooperative behavior increased and then in A2 equilibrated at a moderately high level. When she reciprocated with tokens which could be traded for sweets, movies, and toys, cooperative behavior equilibrated at a very high level. The time spent in scholastic activities changed in similar fashion except the tokens made more of a difference. In general, the results suggest that in the long run the rate of aggression (as well as of other types of student behavior) is proportional to the reinforcing value of the teachers reciprocation in the exchanges she programs in the classroom. Thus the teacher's authority in the classroom depends entirely upon what she exchanges and how she learns to program those exchanges. The results were strong, explaining 50 to 95 per cent of the variation in aggression and cooperation for the individual and grouped data.

FOOTNOTES

1. In terms of its effects on behavior, punishment in the sense referred to here should be distinguished from punishment in the sense of withdrawal of positive reinforcement. (See (10) , pp. 11-15; (13), pp. 224-227 and pp. 229-230.)

2. A goal response is defined as "that reaction which reduces the strength of instigation to a degree at which it no longer has much tendency to produce the predicted behavior sequence." (20), p. 6.

3. In much the same manner, hunger drives may be reduced by eating to the point where one is no longer hungry. According to Bijou and Baer the mark of complete satiation is the failure of a reinforcer (food) to strengthen behavior (maintain eating behavior). ((12), p. 65).

4. These data remind one of Sterling's criticisms of current statistical methods in Psychology. He pictures hundreds of experiments being done but only the 5 per cent or so with significant results published, the others suppressed. Consequently, he wonders just how much of psychological theory is based on Type I or alpha errors. Certainly, mixed results like these lend credence to his thesis (52).

5. According to recent utility theory the probability of response (our O) is a multiplicative function of the estimated probability of success of outcome (our P_{OR}) and of the value of the outcome (our V_R). Cf. (25).

6. See (29). In this study, measured aggression increased as a .54 power function of the cumulated units of interference. A power function generally appears to describe stimulus respondent relationships, be they conditioned, as this one probably is, or unconditioned. The fit is as good as ordinarily obtained in psychophysics which deals almost if not exclusively with unconditioned stimulus-respondent relationships, e.g., light and the sensation of brightness.

7. Ardrey in a book which has received considerable notice, The Territorial Imperative, assumes that aggression is biologically determined--unavoidable (2). Azrin et al. (4, 5) have conducted a brilliant series of experiments testing for a pain-aggression reflex in animals. Their results are mixed to this point, suggesting such a reflex in some animals. Even if it were not, generalization of such findings to man would be questionable. Just because a scientist is able to demonstrate a series of nest building reflexes for birds does not mean ipso facto that the same reflex occur in man.

8. Complete in the sense that she was able to get the boys to do nearly everything she wanted them to do.

REFERENCES

1. Appel, M. H. "Aggressive Behavior of Nursery School Children and Adult Procedures for Dealing with Such Behavior," Journal of Experimental Education, 11, 1962, pp. 185-199.

2. Ardrey, R., The Territorial Imperative, New York: Atheneum, 1966.

3. Azrin, N. H. "Effects of Punishment Intensity during Variable-Interval Reinforcement," Journal of Experimental Analysis of Behavior, 3, 1960, pp. 123-142.

4. Azrin, N. H., Hake, D. F., and Hutchinson, R. R. "Elicitation of Aggression by a Physical Blow," Journal of Experimental Analysis of Behavior, 8, 1965, pp. 55-57.

5. Azrin, N. H., Hutchinson, R. R., and Sallery, R. D. "Pain-Aggression toward Inanimate Objects," Journal of Experimental Analysis of Behavior, 7, 1964, pp. 454-457.

6. Azrin, N. H., and Mols, W. E., "Punishment," in Honig, W. K. (ed.) Operant Behavior: Areas of Research and Application, New York: Appleton-Century Crofts, 1966.

7. Bandura, A., "Punishment Revisited," Journal of Consulting Psychology, 26, 1962, pp. 298-301.

8. Bandura, A., Ross, D., and Ross, S., "Transmission of Aggression through Imitation of Aggressive Models," Journal of Abnormal and Social Psychology, 63, 1961, pp. 575-582.

9. Bandura, A., Ross, D., and Ross, S., "Imitation of Film-Mediated Aggressive Models," Journals of Abnormal and Social Psychology, 66, 1963, pp. 3-11.

10. Bandura, A., and Walters, R. H., Social Learning and Personality, New York: Holt, Rinehart, and Winston, 1956.

11. Baruch, D. New Ways in Discipline, New York: Fountain, 1957.

12. Bijou, S. W., and Baer, D. M., Child Development: Vol. 1, New York: Appleton-Century-Crofts, 1961.

13. Blau, Peter, Exchange and Power in Social Life, New York: Holt, Rinehart, and Winston, 1964.

14. Boulding, K., Conflict and Defense, New York: Harper and Row, 1962, p. 324.

15. Brinkman, E. H.,"Group Influences on the Individual in the Classroom," Merrill-Palmer Quarterly, 9, 1963, pp. 195-204.

16. Brown, P., and Elliott, R., "Control of Aggression in a Nursery School Class," Journal of Experimental Child Psychology, 2, 1965, pp. 103-107.

17. Buss, A. H., The Psychology of Aggression, New York: John Wiley and Sons, 1961.

18. Church, R. M., "The Varied Effects of Punishment on Behavior," Psychological Review, 70, 1963, pp. 369-402.

19. Day, R. C., and Hamblin, R. L., "Some Effects of Close and Punitive Supervision," American Journal of Sociology, LXIX, 1964, pp. 499-510.

20. Dollard, J., Doob, L. W., Miller, N. E., Mowrer, O. H., Sears, R. R., Frustration and Aggression, New Haven: Yale University Press, 1939.

21. Education and World Order: Aggression, The Child, and The Community, A Survey. Unpublished Mimeo report, University of Keele, North Staffs, Series A.

22. Estes, W. K., and B. F. Skinner, "Some Quantitative Properties of Anxiety," Journal of Experimental Psychology, 1962, 26, pp. 298-301.

23. Feshback, S., "The Drive-Reducing Function of Phantasy Behavior," Journal of Abnormal and Social Psychology, 50, 1955, pp. 3-11.

24. Feshback, S., "The Catharsis Hypothesis and Some Consequences of Interaction with Aggressive and Neutral Play Objects," Journal of Personality, 24, 1956, pp. 449-462.

25. Galanter,

26. Galtung, J., "A Structural Theory of Aggression," Journal of Peace Research, 2, 1964, pp. 96-119.

27. Glazer, N., "Alienation," Commentary, 1947, p. 385.

28. Hamblin, R. L., "Punitive and Non-Punitive Supervision," Social Problems, 11, 1964, pp. 345-359.

29. Hamblin, R. L., Bridger, D. A., Day, R. C., and Yancey, W. L., "The Interference Aggression Law?" Sociometry, 26, 1963, pp. 190-216.

30. Hartup, W. W., "Peers as Agents of Social Reinforcement," Young Children, January, 1965.

31. Hays, W., Statistics for Psychologists, New York: Holt, Rinehart, and Winston, 1963.

32. Hokanson, J. E., and Burgess, M. "The Effects of Three Types of Aggression on Vascular Processes," Journal of Abnormal and Social Psychology, 64, 1962, pp. 446-448.

33. Hokanson, J. E., and Shetler, S., "The Effect of Overt Aggression on Physiological Arousal Level," Journal of Abnormal and Social Psychology, 63, 1961, pp. 445-454.

34. Homans, G., Social Behavior: Its Elementary Forms. New York: Harcourt, Brace, and World, 1961.

35. Horwitz, M. "Power over Decision-Making and the Response to Frustration by Group Members," cited in Lander, I., "Group Membership and Individual Security," Human Relations, II, 1958, pp. 99-111.

36. Jones, E. (ed.), Collected Papers, Vol. I, London: Hogarth, 1924, pp. 284-359.

37. Lewin, K., Lippitt, R., and White, R. K., "Patterns of Aggressive Behavior in Experimentally Created "Social Climates," Journal of Social Psychology 10, April, 1939, pp. 271-299.

38. Lippitt, R., and Gold, M., "Classroom Social Structure as a Mental Health Problem," Journal of Social Issues, 15, 1959, pp. 40-49.

39. Kahn, M. A Polygraph Study of the Catharsis of Aggression, Unpublished doctoral dissertation, Harvard University, 1960.

40. Kenny, D. T., An Experimental Test of the Catharsis Theory of Aggression. Unpublished doctoral dissertation, University of Washington, 1952.

41. Magaziner, D., "The Reduction of Hostility without Catharsis," Paper presented at Eastern Psychological Meetings, April, 1961.

42. Morse, F., Conflict in the Classroom, New York: Wiley, 1964.

43. Neill, A. S., Summerhill, London: Kegan Paul, 1961.

44. Pepitone, A., and Reichling, G., "Group Cohesiveness and the Expression of Hostility," Human Relations, 8, 1955, pp. 327-337.

45. Redl, Fritz., "Ten Types of Group Formations," in Sociological Theory: A Book of Readings, Coser, L., and Rosenberg, B. (eds.), New York: Macmillan, 1964.

46. Redl, F., and Wineman, D., Controls from Within: Techniques for the Treatment of the Aggressive Child. New York: Free Press, 1957.

47. Roucek, E. (ed.), The Difficult Child, Chicago : Scott Foresman, 1963.

48. Sears, R. R., Macoby, E. E., and Levin, H. "The Socialization of Aggression," in Macoby, E. E., Newcomb, T. M., and Hartley, E. L., Readings in Social Psychology, New York: Henry Holt, 1958, pp. 350-358.

49. Skinner, B. F., "Contingencies of Reinforcement in the Design of a Social Structure," Behavior Science, , 1966.

50. Sidman, M. Tactics of Scientific Research, New York: Basic Books, 1960.

51. Solomon, R. L., "Punishment," American Psychologist, 19, 1964, pp. 239-253.

52. Sterling, T. D., "Publication Decisions," Journal of the American Statistical Association, 54, 1959, pp. 30-34.

53. Thibaut, J., and Coules, J. "The Role of Communication in the Reduction of Interpersonal Hostility," Journal of Abnormal and Social Psychology, 47, 1952, pp. 770-778.

54. Thibaut, J., and Riecken, H., "Authoritarianism, Status, and the Communication of Aggression," Human Relations, 8, 1955, pp. 95-100.

55. Walters, J. C., Pearce, D., and Dahms, L., "Affectional and Aggressive Behavior of Pre-School Children," Child Development, 28, 1957, pp. 15-26.

56. Worchel, P., "Catharsis and the Relief of Hostility," Journal of Abnormal and Social Psychology, 55, 1957, pp. 238-243.

APPENDIX 1

During the initial (training) observational periods, teacher and token woman became familiar with the frame of reference of the behavior sequence. The behaviors listed below were categorized in terms of aggressive or cooperd ive means of completing behavior sequences.

Aggressive Responses. The child hits, pursues with intent to hit, threatens to hit, snatches, pulls roughly or pushes roughly, is abusive, spits, throws things violently, breaks things deliberately, is defiant, incites one child to hit the teacher or to hit another child, emits loud screams deliberately.

Cooperative Responses. The child asks permission, shares his possessions, helps other children, complies with the teacher's requests, initiates cooperation by physically holding hands, etc., sympathetically draws the attention of the teacher to the plight of children in discomfort, injured.